



**US Army Corps
of Engineers®**

Engineer Research and
Development Center

Monitoring Completed Navigation Projects (MCNP)

Montgomery Point Lock and Dam

Problem

By 2009, Montgomery Point Lock and Dam on the lower White River will have been in place for 5 years. The lower portion of the White River, approximately 9.8 miles, is actually the downstream limits of the 445-mile long McClellan-Kerr Arkansas River Navigation System. The design of the Montgomery Point Lock and Dam was accomplished with the aid of three models at the ERDC/WES – a fixed-bed navigation model, a coal-bed movable-bed model, and gate section model. The purpose of this research is to document project performance – navigation-wise, sedimentation-wise, and dam gate performance, and to compare the prototype performance to the predictions/performance of the 3 ERDC/WES models. It is felt that 5 years is a reasonable period to document this performance and to allow the White River to react to the installation and operation of the Montgomery Point Lock and Dam.



Research Approach

The research approach to document and evaluate the prototype performance is multi-faceted and uses a wide range of engineering tools. To address navigation issues and identify potential problems of navigational alignment of traffic, the CHL at ERDC/WES will use GPS on 8-barge towboats in combination with time-lapsed photography to monitor the tows' approaches to the lock. Additionally, data will be taken on 15-barge tows passing through the navigation pass. ADCP will be used to document currents in the upstream and downstream lock approaches and at the floating guard walls. These data will be used to validate the navigation physical model. Concerning sedimentation issues, hydrographic survey data from the Little Rock and Memphis Districts will be assembled to document sedimentation trends and problems. Deposition upstream of the navigation pass will be monitored to validate estimates used in the study to forecast O&M dredging costs, and potential sedimentation problems in the upstream lock approach and at the floating upstream guard wall will be monitored and compared to the WES movable-bed model results. Relative to the Montgomery Point Dam, data will be collected on measured loads when the gates are closed and holding a pool, when the gates are lowered and flow is passing over them, and when the gates are lowered and navigation is also passing over them. These data, in concert with data already being collected on the dam gates, will be used to evaluate the CHL gate section model. The Little Rock District is also interested in determining the spillway gate ratings and impact loads on the floating guard walls at the lock.

Labs/others involved

ERDC/GSL, Little Rock District, Southwest Division, Memphis District, and Mississippi Valley Division.

Final Products

Main final product from this research will be an ERDC Technical Report presenting the findings from the monitoring effort and the model-prototypes comparisons. The results of this research will initially be of assistance to the Little Rock District and Southwest Division as it concerns the specific performance of the Montgomery Point Lock and Dam. Data and information will also be useful to Corps offices which have similar hydraulic conditions of the confluence of two major streams and the long-term degradation of the receiving stream. Data from the Mississippi River will be useful in documenting the effects of bendway weirs that have been installed in this reach by the Memphis District of the Mississippi Valley Division. Data from the Montgomery Point Dam gates will be useful across the Corps where similar type gates may be considered in the future, particularly relative to dam rehabilitation.

Point of Contact

Howard E. Park, 3909 Halls Ferry Rd., Vicksburg, MS 39180, phone: 601 634-4011, e-mail: [Howard.E.Park@erdc.usace.army.mil].

Montgomery Point Lock and Dam web site is
www.swl.usace.army.mil/projmgt/montpoint.html.